Name	

Zig Zag Education

ZigZag Education supporting

OCR AS Computer Science

Component 1: Computing Principles (H046/01)

Practice Exam 1

Time: 1 hour 15 minutes

Instructions

- Write your name at the top of this page.
- Answer all questions in the spaces provided.
- Do not use a calculator.

Information

- The marks for questions are shown in brackets [ ].
- The maximum mark for this paper is 70.
- Quality of extended responses will be assessed in questions marked with an asterisk (*).

© ZigZag Education, 2015

1 Modern domestic washing machines contain microprocessors and ROM and RAM microchips. They allow the operator to select a variety of different wash modes, times and temperatures that will vary how the wash cycle is performed.

(a) State the reason why each of the following items is necessary in the washing machine:

(i) Microprocessor

[1]

(ii) ROM

[1]

(iii) RAM

[1]

(b) The microprocessor uses a RISC-based architecture.

(i) State what RISC stands for.

[1]

(ii) Describe the relationship between RISC instructions and processor cycles.

[1]

(iii) Describe the relationship between CISC instructions and processor cycles.

[1]

(iv) Describe one advantage to using RISC rather than CISC in a washing machine.

[1]

Question 1 continues on the next page

 © ZigZag Education, 2015

(c)* Discuss the implications of consumer demand for more functions on technology, such as washing machines. In your answer consider the implications of connecting a washing machine to the Internet.

[9]

© ZigZag Education, 2015

2 (a) In the table below are three storage technologies. Write the most suitable description for each storage technology from the following list:

- *Large storage space;*
- *Fast to access;*
- *Commonly write-once.*

Storage Technology	Description
Flash	
Optical	
Magnetic	

[3]

(b) From the table shown in (a), name the storage technology that would be most appropriate for the following situations.

(i) High vibration, such as in an aircraft.

.....**[1]**

(ii) A large database in a data centre.

.....**[1]**

(iii) Incremental backup of the changes made to the customer database of a small company.

.....**[1]**

(c) Describe how each of the following storage devices stores data.

(i) HDD

[1]

(ii) DVD

[1]

(iii) USB memory stick

[1]

Turn over for the next question

 © ZigZag Education, 2015

3 The following code declares an array and stores string values in the array elements.

```
Array games[3]
games[0] = "chess"
games[1] = "noughts and crosses"
games[2] = "firesticks"
games[3] = "hop skotch"
```

(a) Running this code will result in an error. Describe the error.

[1]

(b) Using this array, state what the following line of code would show on the screen.

```
print(games[2].substring(2,4))
```

[1]

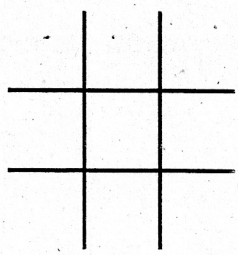
(c) State what is meant by a two-dimensional (2D) array.

[1]

(d) Noughts and crosses (sometimes called tic-tac-toe) is a game played on a board with three rows of three squares. Give an example declaration of a 2D array called 'board' that could be used for this game.

[1]

Here is a diagram of a noughts-and-crosses board to help you:



Turn over for the next question

© ZigZag Education, 2015

4 (a) Convert the denary number 59 into a binary 8-bit byte.

[2]

(b) Using two's complement binary, perform 97 – 59. Show your working.

[4]

(c) Convert the denary number 59 into hexadecimal.

[2]

Turn over for the next question

© ZigZag Education, 2015

5 A pub serves beer and food for consumption on its premises. The pub has the following conditions:

- Anybody can have food.
- People under the age of 18 cannot have just beer.
- A person who is at least 16 years of age and accompanied by an adult can have beer as long as they also have food.

The following notations have been assigned:

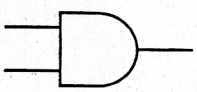
A = your age
B = beer
F = food
X = accompanied by an adult

(a) Using Boolean algebra, write the relationship between A, B, F and X:

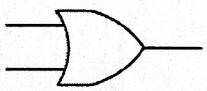
B =

[4]

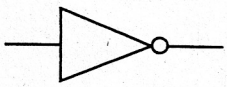
(b) Name the three logic gate symbols shown:

(i) 

[1]

(ii) 

[1]

(iii) 

[1]

Question 5 continues on the next page

© ZigZag Education, 2015

(c) Complete the truth table for each logic gate in the following table:

A	B	A ∧ B	¬ (A ∧ B)	A ∨ B	¬ (A ∨ B)	A ⊻ B
F	F					
F	T					
T	F					
T	T					

[5]

Use the space below for your working.

Turn over for the next question

© ZigZag Education, 2015

6 (a) State what is meant by a protocol and why they are necessary for communication.

[2]

(b) Describe the purpose of TCP/IP.

[2]

(c) With regard to data transmission, compare packet switching with circuit switching.

[6]

Turn over for the next question

© ZigZag Education, 2015

7 (a) Describe generally the overall purpose of a computer operating system.

[1]

(b) Describe what is meant by a peripheral.

[2]

(c) Describe what is meant by a device driver.

[2]

(d) State where you would obtain a specific device driver for a new device.

[1]

(e) State why a non-specific or generic device driver might not be as good as a specific device driver.

[1]

Turn over for the next question

© ZigZag Education, 2015

8 Name the specific law that covers each of the following offences.

(a) Distributing a computer virus.

[1]

(b) Downloading for free from the Internet a feature film that has just been released to cinemas.

[1]

(c) Using an image from the Internet on your social media page without permission from the owner.

[1]

(d) Opening an envelope delivered by a public postal service that is addressed to somebody else.

[1]

© ZigZag Education, 2015